

In the Specification

Please amend the specification substituting "i2 Demand Manager" with "i2 DEMAND MANAGER™," where indicated below:

On page 1, in the paragraph beginning with "The present invention relates," please substitute accordingly:

The present invention relates to information processing using multidimensional databases, and particularly to automatically creating, retrieving, and formatting data for an i2 ~~Demand Manager~~ DEMAND MANAGER™ Application.

On pages 1-2, in the paragraph beginning with "A product/application," please substitute accordingly:

A product/application called ~~Demand Manager~~ DEMAND MANAGER™ from i2 Technologies Corporation dynamically retrieves data from DB/2 databases for viewing by users. The i2 application simulates a multi-dimensional, hierarchical database, where the user must design and create each dimension and hierarchy based on a selected business process. The user must define each data measure based upon which dimensions of the database the data measure pertains to, as well as how far down the hierarchy the data is to be loaded and ultimately viewed. A multidimensional database can organize numeric data along a plurality of dimensions, for example, product, geography, and measures dimensions. The product dimension may reflect the hierarchy of products in the organization. The geography dimension typically reflects locations of the corporate organizations, sales districts, zip codes, and the like. The measures dimension presents detailed data on income, revenue, expenses, and quantities, among other related factors. The combination of these forms a

coordinate set in the i2 ~~Demand Manager~~DEMAND MANAGERTM system, such as, "Product A," "US," and "Expense." The multidimensional database is able to retrieve a numeric or alphanumeric value that represents an aggregated value of the specified measure for the specified dimensional coordinates.

On page 2, in the paragraph beginning with "From a user perspective," please substitute accordingly:

From a user perspective, an important feature of database management software is the user interface. The inputted data must be in a predefined format, and loaded prior to being used. The data is generally organized in a specific manner with each data measure tagged to a key so that the ~~Demand Manager~~DEMAND MANAGERTM application can properly display the data. Currently, the maintenance and loading of the data, as well as maintenance and generation of the keys, is a manually intensive, error prone process. The present invention eliminates manual data entry, and allows for simplified modifications to the data, and ease of data retrieval.

On page 2, in the paragraph beginning with "The i2 Demand Manager," please substitute accordingly:

The i2 ~~Demand Manager~~DEMAND MANAGERTM is a browser-based application that lets a user view data, perform interactive forecasting, and conduct exception analysis for applications that require multi-dimensional analytical services. Through i2 ~~Demand Manager~~DEMAND MANAGERTM, one can view a spreadsheet that contains plan exceptions, historical data, such as sales in dollars, sales in units, and the like, or forecast projections for products within geographical locations and time periods of the user's choice,

displayed and aggregated simultaneously to various levels of detail, for example, in increments of weeks, months, or quarters. Currently, one of the most challenging problems associated with the i2 ~~Demand Manager~~ DEMAND MANAGER™ is the creation of a data entry mechanism that allows users to efficiently load and maintain all the necessary data measures for operation.

On page 3, in the paragraph beginning with "Dimension – A dimension," please substitute accordingly:

Dimension - A dimension is fundamental to the application. It identifies characteristics of the data in a database, such as geography, by which all the data in the database can be grouped and retrieved. The ~~Demand Manager~~ DEMAND MANAGER™ database may contain any number of dimensions, with the three most common being product, time and geography. Each dimension contains one or more hierarchies of nested levels. For example, in Fig. 2, the geography dimension 20 is selected, and the top level of the geography hierarchy 22, World, contains four members at the subordinate geography level 24: Americas, AP, DIV, EMEA. The Americas Geography contains four lower level members, Americas Plan, Canada, LA, and USA at the sub-geography level.

On page 4, in the paragraph beginning with "Data Intersection - Data," please substitute accordingly:

Data Intersection - Data is managed at the intersection of one or more members for each dimension for which the data is keyed. For instance, if, for example, "backlog" is stored at the Region level in the geography dimension shown in Fig. 2, or the SOS level 30 of the Manufacturing dimension 32 depicted in Fig. 3, or the Partial Week level 40 of the time

dimension 42 depicted in Fig. 4, then a specific data intersection is named, that is, a specific region, SOS, or partial week that yields an actual number in the spreadsheet. One such example includes the following designations: Region=USA, SOS=Poughkeepsie, NY, and Partial Week=February 10-16. In the ~~Demand Manager~~DEMAND MANAGER™ spreadsheet, the data retrieved from each database intersection is displayed in a spreadsheet cell.

On page 4, in the paragraph beginning with "After the scope," please substitute accordingly: After the scope of a particular session has been defined, ~~Demand Manager~~DEMAND MANAGER™ displays a spreadsheet that contains the data measures with their respective data, dimension levels, and the members selected during the scope definition period. Fig. 5 depicts a partial sample of a spreadsheet 50 from the i2 ~~Demand Manager~~DEMAND MANAGER™ with selected data.

On page 4, in the paragraph beginning with "There are two DB/2," please substitute accordingly:

There are two DB/2 databases that make up the ~~Demand Manager~~DEMAND MANAGER™ database: the persistence database, also known as i2dm in the i2 documentation, which contains the metadata, including definitions of the database, level, level instances, scopes, sessions, security, and the like; and the measure database, also known as i2dmdb in the i2 documentation, which contains the data for the specific intersections of each measure. Historical data, generally non-modifiable, is loaded into the measure database from legacy systems. Forecast data, which is generally modifiable data in ~~Demand Manager~~DEMAND MANAGER™, gets automatically inserted into the measure database upon user entry.

On page 5, in the paragraph beginning with "Bearing in mind," please substitute accordingly:
 Bearing in mind the problems and deficiencies of the prior art, it is therefore an object of the present invention to provide an integration control and data manager for automatically creating, retrieving, and formatting data for an i2 ~~Demand Manager~~DEMAND MANAGERTM Application

On page 5, in the paragraph beginning with "A further object," please substitute accordingly:
 A further object of the invention is to provide an integration control and data manager for modifying and updating data files for input to an i2 ~~Demand Manager~~DEMAND MANAGERTM database.

On pages 5-6, in the paragraph beginning with "The above and other objects," please substitute accordingly:

The above and other objects, which will be apparent to those skilled in art, are achieved in the present invention, which is directed to in a first aspect, a method for automating the creation and maintenance of an i2 ~~Demand Manager~~DEMAND MANAGERTM database, comprising: building i2 ~~Demand Manager~~DEMAND MANAGERTM persistence and measure databases, including creating SQL and generating a first set of programs to retrieve data from source systems; storing the data in configuration tables; activating a second set of programs to read the configuration tables and create XML files and SQL statements; formatting the data based on defined data measures; and loading the data into the i2 ~~Demand Manager~~DEMAND MANAGERTM database. Loading the data further comprises generating control tables to control the loading, including determining which of the data measures are to

be loaded and when loading occurs. The configuration tables further include: control, product, dimension, level, hierarchy, user ID, logging, and security tables. The method further comprises running a script to execute the first and second set of programs. The XML files are input into an i2 utility to build the i2 ~~Demand Manager~~ DEMAND MANAGER™ database. The programs input measure data for the measure database, the measure data residing in staging tables and fact tables. The method also includes inputting spreadsheet information into the product tables, dimension tables, level tables, and hierarchy tables. A warehouse manager program facilitates data storage and retrieval. The persistence database is built using an i2 utility program, such that the configuration files are inputs to the i2 utility program. The XML files are referenced in the configuration files, converting the XML files to meta data, and providing the i2 utility program with the SQL statements. The method further includes installing the configuration files including installing information for location for middleware components and DB/2 aliases. The XML file defines a skeleton of the database, including dimension, levels, and measures. Loading the data into the i2 ~~Demand Manager~~ DEMAND MANAGER™ database includes generating a load file for loading hierarchy instances and targets, and placing the load file in an administrative directory. The dimension table includes: a master dimension source table; a table holding views; a table holding hierarchy level information for each dimension; a table containing information to each level; a table containing information to each measure; a table holding lookup information for location; a table holding information for level members; a table holding data for intersections of the database; tables containing user ID, password, and security information; and tables holding each process and each event of each process. The method further includes generating measure configuration tables comprising: generating a master measure source table; holding dimensionality information for each of the measures;

addressing level members; and generating measure data tables. Programs are generated to read the master measure source table and the dimensionality information, the programs automatically generate SQL for the tables. Logger tables are generated to log process or program execution, data loading tables, and forecast measure initialization tables.

On pages 6-7, in the paragraph beginning with " In a second aspect," please substitute accordingly:

In a second aspect, the present invention is directed to a computer program product comprising: a computer usable medium having computer readable program code means embodied therein for causing a method for generating a set of tables and programs to automate the creation and recreation of an i2 ~~Demand Manager~~ DEMAND MANAGER™ database application, the computer readable program code means in the computer program product comprising: computer readable program code means for causing a computer to effect building i2 ~~Demand Manager~~ DEMAND MANAGER™ persistence and measure databases, including creating SQL and generating a first set of programs to retrieve data from source systems; computer readable program code means for causing a computer to effect storing the data in configuration tables during the building; computer readable program code means for causing a computer to effect activating a second set of programs to read the configuration tables and create XML files and SQL statements; computer readable program code means for causing a computer to effect formatting the data based on defined data measures; and computer readable program code means for causing a computer to effect loading the data into the i2 ~~Demand Manager~~ DEMAND MANAGER™ database. The computer program product includes computer readable program code means for generating the configuration tables further comprising: control, product, dimension, level, hierarchy, user ID, logging, and

security tables. The computer program product further includes computer readable program code means for inputting the XML files into an i2 utility to build the i2 ~~Demand Manager~~DEMAND MANAGERTM database.

On page 8, in the paragraph beginning with "Fig. 3," please substitute accordingly:

Fig. 3 depicts the SOS level of the Manufacturing dimension for an example i2 ~~Demand Manager~~DEMAND MANAGERTM spreadsheet.

On page 8, in the paragraph beginning with "Fig. 4," please substitute accordingly:

Fig. 4 depicts the Partial Week level of the Time dimension for an example i2 ~~Demand Manager~~DEMAND MANAGERTM spreadsheet.

On page 8, in the paragraph beginning with "Fig. 5," please substitute accordingly:

Fig. 5 depicts a partial sample spreadsheet from the i2 ~~Demand Manager~~DEMAND MANAGERTM with selected data.

On page 9, in the paragraph beginning with "The present invention automates," please substitute accordingly:

The present invention automates: 1) the creation and maintenance of an i2 ~~Demand Manager~~DEMAND MANAGERTM database; 2) the retrieval of data from source systems; 3) the formatting of the data automatically based on how the data measures are defined; and 4) the loading of the data into the i2 application underlying DB/2 tables.

On page 9, in the paragraph beginning with "In an i2 Demand Manager," please substitute accordingly:

In an i2 ~~Demand Manager~~DEMAND MANAGER™ application, the persistence and measure databases described above must be built and loaded with data on a periodic basis.

On page 11, in the paragraph beginning with "Fig. 6 depicts," please substitute accordingly:

Fig. 6 depicts the Integrated Control and Data Manager 60 of the present invention. Numerous configuration tables are generated. These include control tables 62, product tables 64, dimension tables 66, level tables 68, hierarchy tables 70, user ID tables 72, logging tables 74, and security tables 76. Programs 92 are designed to read from these tables and automatically produce the XML 94 and SQL files needed to build or rebuild the database for the i2 ~~Demand Manager~~DEMAND MANAGER™. By employing this automated data entry and retrieval application, a change to the database schema simply requires a change or changes to one or more of the tables. Once the tables are generated, a script is run to execute the programs to generate all the files to build or rebuild the database.

On page 11, in the paragraph beginning with "The measure data resides," please substitute accordingly:

The measure data resides in staging tables 78 and fact tables 80. These tables receive input from various data sources 82. The present invention includes programs 84 to input this data to the Integrated Control and Data Manager (ICDM) 60. Programs 86 are generated to load the data into the measure data tables 100 of the i2 ~~Demand Manager~~DEMAND MANAGER™ Database 102. Importantly, this suite of programs access the same tables in the ICDM 60 to load data that other programs use to build the database. The data retrieval and loading is

tightly integrated, assuring for quick, error free building/rebuilding of the ~~Demand Manager~~DEMAND MANAGER™ database, and quick, error free, data loading that lends itself to customization.

On page 12, in the paragraph beginning with "The Persistence Database," please substitute accordingly:

The Persistence Database is built using an i2 utility called i2DMutils. This utility takes a configuration file, named i2DM.cfg, as an input. This file references, among other things, many XML files, which define the database. The XML files are converted into the metadata mentioned above and loaded into the i2dm database. The XML files will need to be generated or created. In addition to the XML files, the ~~Demand Manager~~DEMAND MANAGER™ server code needs the location of the data for each measure, such as database and table locations. The persistence database is referred to as i2dm, and the tables that contain the data for the measures are referred to as icdm database. In order to build the ~~Demand Manager~~DEMAND MANAGER™ database, the build utility must be provided, including all the information, such as SQL statements, that the server code will need to retrieve the measure data. This information (SQL) is stored in a file, called src.sql, and is executed when the database is being built.

On page 12, in the paragraph beginning with "Some of the XML and SQL files," please substitute accordingly:

Some of the XML and SQL files, which have to be created to build or rebuild the ~~Demand Manager~~DEMAND MANAGER™ database, are given in the Tables below. In all cases, these represent small excerpts of a complete file.

On page 19, in the paragraph beginning with "XML files are needed," please substitute accordingly:

XML files are needed for defining users and user security. These files include, but are not limited to, those files needed to define users and groups of users, security files for dimensions, levels, measures, and domains, custom groups created in the i2 ~~Demand Manager~~DEMAND MANAGER™ to grant hierarchy member security, and an XML file to create domains, to name a few.

On page 20, in the paragraph beginning with "In the i2 Demand Manager architecture," please substitute accordingly:

In the i2 ~~Demand Manager~~DEMAND MANAGER™ architecture, a user has no initial access rights to any object. Access rights need to be granted to the user for dimensions, levels, measures, and domains (for level instances and measure data). Table VII represents excerpts from a preferred usersecurity.xml file. Access rights are given to dimensions, levels, measures, measure data. The present invention includes a program to generate a user security XML file.

On page 22, in the paragraph beginning with "Custom groups," please substitute accordingly:

Custom groups may also need to be created in the i2 ~~Demand Manager~~DEMAND MANAGER™ to grant hierarchy member security, and thereby grant access to a subset of the entire hierarchy. Custom groups can be viewed as sub-trees within a hierarchy. Each has a root level, an upper bound level, and a lower bound level. Once a custom group is created, domains are defined and users or groups are given access to the defined domain. An XML

file is required to create custom groups. This file contains definitions of the custom groups in terms of the root, upper bound, and lower bound levels. The present invention includes a program to generate this file. By its nature, this file could potentially become very large. Specific member instance codes have to be specified as detailed with the "MEMBER CODE" parameter shown below. Table VIII depicts a sample portion of a customgroups.xml file.

On page 23, in the paragraph beginning with "As noted above," please substitute accordingly:

As noted above, domains are a logical grouping of custom groups from one or more dimensions to which i2 ~~Demand Manager~~ DEMAND MANAGER™ users are granted access rights. Preferably, domains are created after custom groups, and consist of custom groups previously generated. A domain needs to be created for controlling access to hierarchy members and data measures. This is done to give users access to these measures in the context of those custom groups. Domains that are used for granting access to hierarchy members comprise custom groups that belong only to one dimension. For data measures, the domains should comprise a combination of custom groups – one from each dimension, and should make up the dimensionality of that measure. The present invention requires an XML file to create domains. This file contains definitions of the domain in terms of a collection of custom groups. Table IX depicts a sample section of a domains.xml file for the present invention.

On page 24, in the paragraph beginning with "This file sets," please substitute accordingly:

This file sets the current date for the application. A program exists to generate this file, and runs nightly at 12:01 AM to reset the current time token in the i2 ~~Demand Manager~~DEMAND MANAGER™. Table X depicts a sample curtime.xml file.

On pages 24-25, in the paragraph beginning with "Once the meta data," please substitute accordingly:

Once the meta data has been loaded into the i2 ~~Demand Manager~~DEMAND MANAGER™, the default hierarchies and cube definitions are loaded, along with role definitions for different users. The default hierarchies represent a starting point for grouping levels into logical aggregation paths. The cube definitions group the i2 ~~Demand Manager~~DEMAND MANAGER™ measures in terms of behavior, such as bi-measure, single point, and the like, and data import levels. Role definitions are used to allow individual users to perform different tasks, such as defining scopes, creating favorites folders, among others, and to restrict specific users from the same. A program exists in the present invention to generate this file.

On page 28, in the paragraph beginning with "Control tables," please substitute accordingly:

Control tables and programs are also created to control the scheduling and loading of data into the ~~Demand Manager~~DEMAND MANAGER™ database to update the measure data tables, as well as to control and house the business logic that is needed to convert and configure the incoming source data to meet the business requirements.

On page 28, in the paragraph beginning with "Dimension configuration tables," please substitute accordingly:

Dimension configuration tables are generated to handle the dimension information. Configuration includes a master dimension source table, a table for holding the views, a table for holding hierarchy level information for each dimension, a table containing information relating to each level, such as the size of the level, so programs can read it to create the xml files to build the database, a table containing information for each measure, a table holding the dimensionality information for each measure, a table holding the lookup information that the ~~Demand Manager~~DEMAND MANAGERTM server code requires to locate where to get the data for the single point measures, a table to handle level members, a table to hold data for the intersections of the database, a table containing user ID and password information, as well as security information, a table to hold each process, a table to hold each events of processes, a table containing information for each measure regarding loading of the source data, a table for forecast measure initialization, a table containing products that the user would want data on for forecasting, and a table containing logi,c which programs will read to convert the source data into data that can be loaded into the i2 ~~Demand Manager~~DEMAND MANAGERTM.

On page 30, in the paragraph beginning with "The measure.measure_lookup configuration," please substitute accordingly:

The measure.measure_lookup configuration table is used for single point measures. This configuration table holds the lookup information that the ~~Demand Manager~~DEMAND MANAGERTM server code requires in order to locate the data for the single point measures.

Fig. 14 depicts a sample portion of a measure.measure_lookup configuration table.

On page 30, in the paragraph beginning with "Measure data tables," please substitute accordingly:

Measure data tables are configured to hold the data for the intersections of the database. This is the data the user would see in ~~Demand Manager~~ DEMAND MANAGER™, as well as the tables that get updated when the user clicks the "Update Database" button in ~~Demand Manager~~ DEMAND MANAGER™.

On pages 30-31, in the paragraph beginning with "Each measure," please substitute accordingly:

Each measure in the ~~Demand Manager~~ DEMAND MANAGER™ is stored in its own table, because every measure could potentially be keyed at different dimensions and different levels within those dimensions. The table name for each measure is stored in the measure.measure_master table referenced above. The measure data tables are preferably prefixed with the qualifier "DATA." For example, the table that holds the data for the Backlog by CRAD measure might be named DATA.Backlog_CRAD.

On page 32, in the paragraph beginning with "The data load tables," please substitute accordingly:

The data load tables contain information for each measure regarding loading of source data, such as a calendar for each day to determine which measures are to get data refreshed, as well as the date range for data refresh. Programs are generated to read from these tables to determine which data has to be loaded into the ~~Demand Manager~~ DEMAND MANAGER™ database. The programs read from "fact" tables, mentioned below.

On pages 32-33, in the paragraph beginning with "The product tables," please substitute accordingly:

The product tables contain the products for which the user requires data for forecasting. The products in these tables are loaded into the ~~Demand Manager~~DEMAND MANAGER™ database as part of the Product dimension. There is an automated product menu process provided to read an incoming spreadsheet from the customer, processes it, and update the tables. The data in the tables is then loaded into the ~~Demand Manager~~DEMAND MANAGER™ database.

On page 33, in the paragraph beginning with "Data for measure," please substitute accordingly:

Data for measure is sourced from a mainframe database or other alternate source. Once the data is inputted, it is manipulated to fit into the database hierarchy of dimensions, measures, and the like. This process is referred to as business logic. The business logic tables contain logic which program is provided to read in order to convert the source data into data that can be loaded into the ~~Demand Manager~~DEMAND MANAGER™. These programs take the data from the source tables, apply business logic, and update fact tables. The fact tables contain the data in a format that can be loaded into the ~~Demand Manager~~DEMAND MANAGER™ database.

On page 33, in the paragraph beginning with "The present invention," please substitute accordingly:

The present invention primarily concerns computer program codes and their execution. In another aspect of this invention, the compilation of program codes creates a computer

program product comprising: a computer usable medium having computer readable program code means embodied therein for causing a method for generating a set of tables and programs to automate the creation and recreation of an i2 ~~Demand Manager~~ DEMAND MANAGERTM database application, the computer readable program code means in the computer program product comprise: computer readable program code means for: causing a computer to effect building i2 ~~Demand Manager~~ DEMAND MANAGERTM persistence and measure databases, including creating SQL and generating a first set of programs to retrieve data from source systems; causing a computer to effect storing the data in configuration tables during the building; causing a computer to effect activating a second set of programs to read the configuration tables and create XML files and SQL statements; causing a computer to effect formatting the data based on defined data measures; and causing a computer to effect loading the data into the i2 ~~Demand Manager~~ DEMAND MANAGERTM database. Generally architectural hardware is available to store and run these program codes.

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